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THE FISHES OF SANDY HOOK BAY

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New York Aquarium

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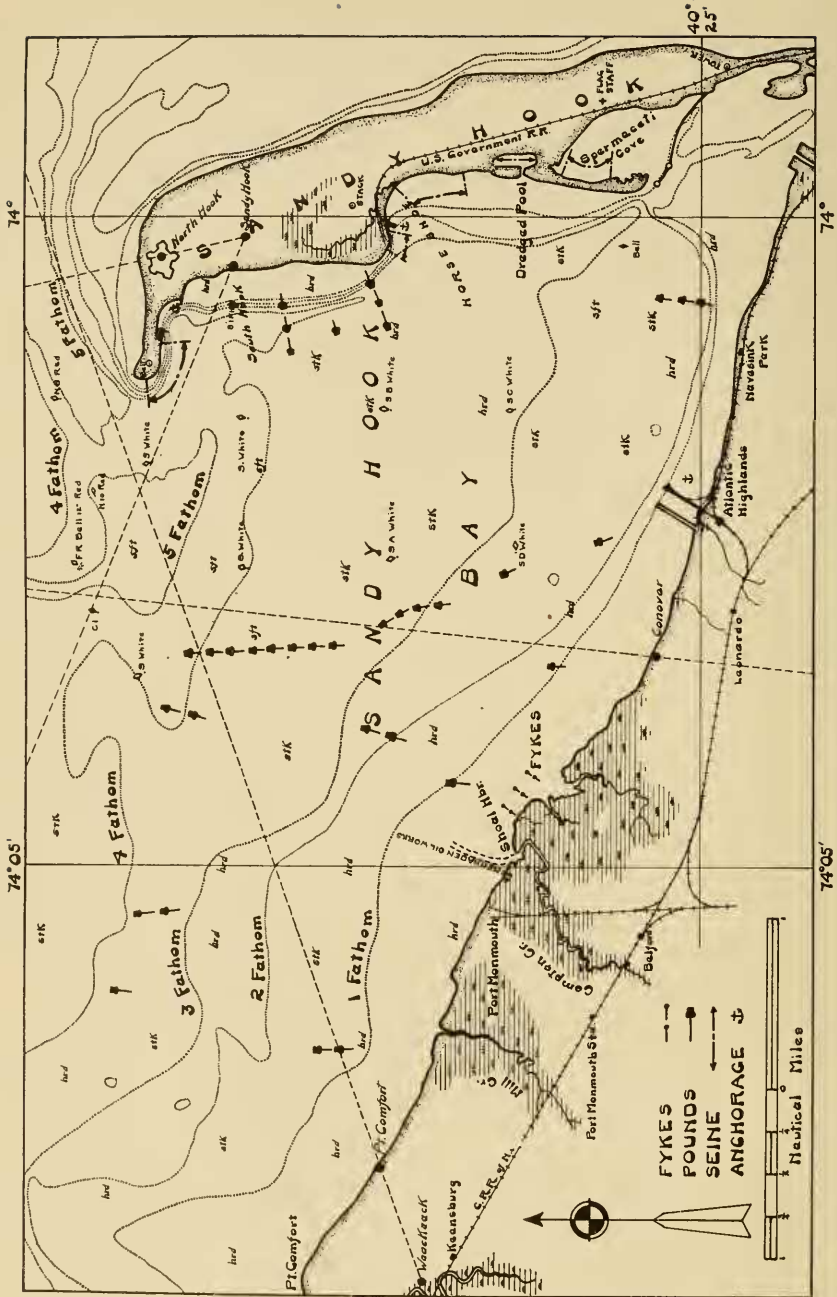


FIG. 129. MAP OF SANDY HOOK BAY

THE FISHES OF SANDY HOOK BAY

By C. M. BREDER, JR.

New York Aquarium

The work of collecting local marine fishes undertaken by the New York Aquarium's wellboat *Seahorse* for the exhibits of that institution has made it possible for the writer to compile an annotated list of the fishes of Sandy Hook Bay during the summer of 1921, which is herewith presented. Much of the material was gathered by visiting the various pound nets at times when the owners were removing their catches. There were thirty-five such traps within the limits of the Bay, and as the accompanying map shows, they were well scattered over the area, in this way intercepting at least a few individuals of practically all species entering the Bay which might be taken in such fishing gear. Late in the season when fykes were set they were likewise visited. They were six in number and located along the shore between Port Monmouth and Atlantic Highlands as indicated on the map. A seine, three hundred feet in length, was frequently used on the Beach of the Government Reservation at Sandy Hook, while less often smaller ones were dragged in tide pools and back waters. The shores along which the seines were operated are so marked on the map. Spermaceti Cove was seined only in 1920 as it was found to contain less material than numerous other places, which were more accessible. The beach at Atlantic Highlands was tried but once during 1921 when it was found to be rather unsatisfactory on account of the many submerged snags there present, upon which the net continually caught.

The first records of 1921 were made on June 1 and the last on October 21, which dates mark the beginning and end of the

boat's activity for the year. Between these dates records were made on fifteen trips varying in length from two to five days, the writer accompanying the boat on all except three. On these Mr. S. A. Callisen, of the New York Aquarium, was kind enough to record and report such notes as were of particular interest. Credit is also due him for giving various kinds of assistance in the compilation of this list.

Records relative to 1920 were made by Dr. C. H. Townsend, Director of the Aquarium, who has permitted the use of his log book for that year. His notes extend from June 1 to November 8 and consist of data taken on twenty-four trips of from two to four days duration. As the trips were approximately equidistant throughout both seasons the collections and observations so made give a very fair idea of the fishes to be encountered during the summer in these waters. It is unfortunate that it was impossible to make trips before and after the dates mentioned as the seasonal aspect of the Bay for an entire year would be particularly valuable in regard to the study of the migrations of certain forms. However, it is doubtful if many species not mentioned in the list are present in any considerable numbers in winter.

The kindness of Mr. J. T. Nichols, of the American Museum of Natural History, in allowing a perusal of his scrap book of records and notes on local fishes leaves little doubt as to the authenticity of the early and late dates recorded in this list.

The most recent regional paper on the fishes of New Jersey is "A List of the Fishes of New Jersey" by Henry W. Fowler, *Proceedings of the Biological Society of Washington*, Vol. 33, pp. 139-170, Dec. 30, 1920. This publication gives, under specific captions, the region in which each species is found, by counties. It was rather surprising to find that seventeen species included in the present list have not been recorded,¹ according to Fowler, from Sandy Hook Bay or indeed from any of the waters of Mon-

¹ A short note on thirteen species found in 1920 has been published in *Copeia*, No. 91, Feb. 15, 1921, by C. H. Townsend and J. T. Nichols and a non-annotated list of sixty species taken the same year is given in "The Twenty-fifth Annual Report" of the New York Zoological Society, July, 1921. The substance of the former and all species included in the latter have been incorporated in this paper for convenience in reference.

mouth County.² When it is considered that Monmouth County has a long coast line on the open sea as well as on small bays, and that it is to the entire county that Fowler refers, the actual lack of accurate knowledge concerning the distribution of the fishes of this region is at once apparent. Notice to Fowler's omissions is given under the respective specific headings. Unfortunately the available regional lists of fishes found near New York City contain little or no information concerning exact geographical locations and are therefore practically impossible to compare.

Fowler, in addition, records about forty other marine species from Monmouth County, not in the present tabulation, but as no definite section is indicated, it is not known exactly how many have been taken in the Bay. This rather formidable looking list of names is made up, however, chiefly of pelagic and southern fishes of which comparatively few are likely to find their way into this body of water. While the writer's enumeration in no way pretends to be complete and is admittedly preliminary in nature, it is hoped that it will form an added step to a better knowledge of New Jersey fishes in which direction Mr. Fowler already has made such splendid advances.

The vernacular name following the technical one is, in each case, the local appellation known to be in actual use by the fishermen engaged in procuring their livelihood from this body of water, except in the cases of those few for which no local name appeared to be in current usage. In these instances the common names applied to the species in question in adjacent territories or proposed by other writers are given in brackets. All measurements given are standard lengths except where otherwise stated and in the case of the sharks where the total length is understood. The metric system is used throughout with the approximate English measure following. The annotation following each specific heading is separated into two parts according to the year in which the data was collected, so that the fauna of the Bay may be compared for two consecutive years and in this way be of aid to students of problems to whom such data might be of service. It is to

² Monmouth County has a coast line extending from a point a few miles south of the mouth of the Raritan River, on Raritan Bay to the mouth of the Manasquan River on the seaward coast.

be understood that the specimens were taken in pound nets if no other type of gear is mentioned.

GALEIDÆ

1—*Mustelus canis* (Mitchill) DOGFISH, DOGGIE

Common practically all season during 1920. In the warmest weather few were taken except in the pounds set in the deepest water near the point of Sandy Hook. During 1921 this species was few in number until October 10, after which time it was abundant, varying in length from about 40 to 102 cm. (16½ to 40 inches) and in weight from about .20 to 3.20 kilograms (½ to 7 pounds). A single specimen was taken in a seine near the point of the Hook. On June 1, several copepods were noted on some examples.

2—*Carcharhinus milberti* (Müller and Henle) SHARK, SAND SHARK, GRAY SHARK

Some examples upward of 1 meter (about 3 feet), as well as smaller ones were taken in 1920 from July 15 to September 23. In 1921 one small example was taken on each of the following dates: July 8, 15, 27, September 19, and October 19. This last is a late date for the species, being over a month later than any previous record from this region. One specimen of larger size was taken in mid-July. Fowler gives a single record of this species, which he admits as being a questionable identification, from Monmouth County as being made at Perth Amboy, which locality actually is in Middlesex.

SPHYRNIDÆ

3—*Sphyrna zygaena* (Linnæus) HAMMERHEAD

Small examples, less than 60 cm. (about 2 feet), were seen during both years in mid-summer. Fairly common. None seen before July 14 or after August 26, during 1921.

CARCHARIIDÆ

4—*Carcharias taurus* Rafinesque SHARK, SAND SHARK

Thirty or more individuals seen between June 13 and October 4 in 1920, varying in length from about 60 to 214 cm. (2 to 7

feet). One about 121 cm. (4 feet) long was taken on July 28, 1921, and what was apparently another about 153 cm. (5 feet) was seen basking about five miles south of Coney Island on September 29, which position, however, is really outside the confines of the Bay.

SQUALIDÆ

5—*Squalus acanthias* Linnæus SPINED DOG, THORNED DOGFISH

Taken late in fall of 1920 up to November 8. Many small ones, mostly under 30 cm. (about 1 foot) taken between October 17 and 21, 1921.

RAJIDÆ

6—*Raja erinacea* Mitchell SKATE

Taken on June 1 of both years, and on October 13 and later in 1920. A single example was taken on October 10, 1921. Apparently absent from these waters during the summer months.

7—*Raja eglanteria* Bosc SKATE

Fairly common during season of 1920 except in September. During 1921 quite common from June 1 to July 29, and from October 10 to 21. This species, while generally more common than the preceding, tends likewise to absent itself from this locality in the warmest weather. October 21 is a late date for this Skate.

8—*Raja stabuliformis* Garman BARNDOR SKATE

Taken in November, 1920. One example about three feet in length of disc taken in October, 1921.

DASYATIDÆ

9—*Dasyatis centrura* (Mitchill) STINGER, STINGAREE

Two were taken between June 20 and September 23, 1920. In 1921 a single example was taken on September 16 and another on September 20, both with a length of disc less than 45 cm. (about 18 inches).

MYLIOBATIDÆ

- 10—*Rhinoptera bonasus* (Mitchill) STINGER, STINGERE .

A few taken between June 13 and September 11, 1920. One example with a disc of more than 60 cm. (about 2 feet) in length, taken on August 4, 1921.

ACIPENSERIDÆ

- 11—*Acipenser sturio* Linnæus STURGEON

Fairly common in fall of 1920. One example 45 cm. (about 18 inches) long was taken on September 15, 1921. Fishermen reported having taken a few others about this time.

- 12—*Acipenser brevirostrum* Le Sueur STURGEON

A few small examples were taken in the fall of 1920. Fowler makes no mention of this species being taken in Monmouth County.

ELOPIDÆ

- 13—*Elops saurus* Linnæus SALMON

One example 20 cm. (about 8 inches) long was taken on October 12, 1921. Fishermen spoke early in the season of taking "Salmon" but the identity of the fish they had in mind could not be determined from their descriptions. Very likely they referred to this species. Cape May is the only New Jersey county Fowler records it from.

CLUPEIDÆ

- 14—*Etrumeus teres* (De Kay) [ROUND HERRING]

One example of 37 cm. (about 15 inches) was taken in a fyke on September 20, 1921. The fishermen admitted to not having seen this species before and had no name for it. According to Fowler it has not been recorded from Monmouth County before.

- 15—*Clupea harengus* Linnæus HERRING

A few medium sized examples were taken from June 1 to 23, and one each on July 7 and October 17, 1921. This species is known to be irregular near here, but these observations might be taken to indicate that possibly the Herring is absent from this

Bay in summer. Fowler does not record it as being found in the waters of this county.

16—*Pomolobus pseudoharengus* (Wilson) ALEWIFE, SHADINE

One example of medium size taken on June 1, 1921. Probably a few of this and the following two species were present later, but as it was not always possible to examine each catch in the detail necessary to identify such inconspicuous fish in a boat load of Menhaden it can not be said with certainty.

17—*Pomolobus æstivalis* (Mitchill) SHADINE

From June 1 to July 7, 1921, a few medium sized examples were taken.

18—*Alosa sapidissima* (Wilson) SHAD

Several were taken in 1920 and a few on June 1, 1921.

19—*Opisthonema oglinum* (Le Sueur)

THREAD HERRING, SAW-BELLY

A few were taken in mid-summer in 1920. Medium sized examples were taken from July 7 to 29 and one on October 21, 1921. Very likely they were absent in the interim. Fowler records this species only from Cape May and Atlantic Counties.

20—*Brevoortia tyrannus* (Latrobe)

BUNKER, BANKER, MOSSBUNKER, MENHADEN

Taken at all times during both seasons. Both young and adults abundant, and taken in all gear. As the season of 1921 came to a close their numbers became noticeably less, especially after the middle of September, at which time the Weakfish replaced them to a certain extent. This species forms by far the major part of the pound netters' catch, sometimes to the exclusion of almost everything else. On July 28 a skiff was taken up the "Creek" that has its mouth at the "Horseshoe" on Sandy Hook, and many young Menhaden 10 to 13 cm. (about 4 to 5 inches) long, were seen as far up as it was possible to force the skiff, which was almost a mile, measuring along the bank. This "Creek" is apparently purely salt water, at present, at least, being

merely an arm of the Bay. On July 27 and 28 countless numbers of these fish of a similar size were seen in great schools from the pier at Atlantic Highlands. At this point a large sewer empties just below the surface and the water is consequently heavily charged with various kinds of evil smelling debris. These young fish were in the thick of it, stemming the rather forceful current which the flow from the sewer pipe caused. It appeared that they were feeding, either on the finely divided sewage itself, or else on some small organism drawn there by the large amount of decaying organic matter, although it hardly seems possible that a small pelagic invertebrate, minute enough for these fish to engulf could sustain itself in the strong current urging the debris from the pipe.

About the middle of September several decidedly greenish adults were seen which the fishermen say always appear at this season and which they dub "Irish Bunkers." From a casual examination it was seen that they had fed on some green substance and that the internal organs were likewise suffused with the same color.

ENGRAULIDIDÆ

21—*Stolephorus brownii* (Gmelin) [STRIPED ANCHOVY]

One example was taken on June 7, 1921, in company with the following species. Not previously recorded from Monmouth County according to Fowler.

22—*Stolephorus mitchilli* (Cuvier and Valenciennes)
[COMMON ANCHOVY]

Taken in small numbers on June 7, 29, September 22, October 18 and 21, 1921. Probably present all summer but passing through the meshes of most gear. Large schools of anchovy-like fishes were seen which were very likely composed of this species with a few individuals of the preceding, in proportion to their relative abundance.

ANGUILLIDÆ

23—*Anguilla rostrata* (Le Sueur) EEL

Taken uniformly on practically all trips and in all gear. Both large and small examples were seen.

PÆCILIIDÆ

- 24—
- Fundulus majalis*
- (Walbaum) KILLY

Taken whenever fished for with small seines in back waters, tide pools, and runs. Especially common in the "Horseshoe." Ripe males and females taken June 1 to 23, 1921. In company with the following species but not as abundant.

- 25—
- Fundulus heteroclitus macrolepidotus*
- (Walbaum) KILLY

Abundant, especially in back waters and tide pools, particularly so in "Dredged Pool." Taken whenever such places were seined. Ripe examples of both sexes were taken June 1 to 23, 1921.

- 26—
- Cyprinodon variegatus*
- Lacépède KILLY

Taken only in the large and deep "Dredged Pool" in company with the two preceding species. Males with brilliant coloring seen from June 1 to 23, 1921. Apparently breeding at this time as were the other Pæciliidæ. Specimens apparently spent were taken on July 14 and 22, 1921.

BELONIDÆ

- 27—
- Tylosurus marinus*
- (Walbaum) BILLFISH

Taken in the late fall of 1920. One example 45 cm. (about 18 inches) long was taken in seine on September 27, 1921 and another in a pound net on October 14, the latter being 60 cm. (about 2 feet) long.

GASTEROSTEIDÆ

- 28—
- Apeltes quadracus*
- (Mitchill) STICKLEBACK

One small ripe female taken in back water of the "Horseshoe" on June 1, 1921, and a few, of which the condition was not noted, on July 20 in "Dredged Pool." Fowler gives this species as being unrecorded from Monmouth County.

SYNGNATHIDÆ

- 29—
- Syngnathus fuscus*
- Storer PIPEFISH

Taken in mid-summer of 1920, especially abundant in Spermaceti Cove. Taken between June 23 and October 12, 1921.

Common near the point of Sandy Hook and in the "Horseshoe" in seines. Many males with brood pouches full were observed in mid-summer of this year. At times while riding at anchor in calm weather these fish could be seen swimming or drifting past, a few inches below the surface of the water. On June 21 a post larval example of 13 mm. (about $\frac{1}{2}$ inch) was taken in a bolting cloth tow net at the surface near the mouth of the bay.

30—*Hippocampus hudsonius* De Kay SEAHORSE, HORSEFISH

One specimen taken during 1920. On August 24 and 26, 1921 each, one fair sized example was picked off the leaders of the pound nets by the fishermen. Several others were reported about this time.

ATHERINIDÆ

31—*Menidia menidia notata* (Mitchill) SPEERING, WHITEBAIT

Seined in mid-summer in 1920. Taken in seines from June 21 to September 22, 1921. Very young fry and ripe adults were seen in early part of season, while larger fry and spent adults were seen later.

MUGILIDÆ

32—*Mugil cephalus* Linnæus MULLET, LEAPING MULLET

Common in fall of 1920. A few small examples were taken on June 29, many large ones from July 20 to October 21 during 1921, chiefly in seines and fykes. The adults were exceptionally well nourished and fat. Fowler records this species only from Atlantic and Cape May Counties.

SPHYRÆNIDÆ

33—*Sphyræna borealis* De Kay BARRACUDA

On June 20, 1920, a few very small examples were taken. Three specimens were taken on October 17, 1921 in the seine, two of which measured $16\frac{1}{2}$ and 17 cm. ($6\frac{1}{2}$ and $6\frac{3}{4}$ inches) respectively. Several others of about the same size passed through the meshes at this time.

AMMODYTIDÆ

34—*Ammodytes americanus* De Kay [SAND LANCE, SAND EEL]

A single example, which was probably originally about 5 cm. (2 inches) in length, was taken from the stomach of a small blue-fish caught on June 29, 1921. However, it is possible that it was captured at some point outside the Bay. The reason why this common species, abundant at other points close by should be so scarce in this Bay is not clear, although no doubt later in the fall they appear in numbers.

SERRANIDÆ

35—*Roccus lineatus* (Bloch) STRIPED BASS

Fairly common in fall of 1920. One good sized example was taken in seine on June 22, 1921, which was blind, another in a pound net on September 19, and several small and medium ones were taken in fykes between October 17 and 21.

36—*Morone americana* (Gmelin) WHITE PERCH

Common in fall of 1920. Taken in fykes and pounds. A few medium sized examples were taken in fykes between October 17 and 21, 1921.

37—*Centropristes striatus* (Linnæus) SEA BASS

Taken in late fall of 1920, but not common. After their first appearance on September 28, 1921, this species increased in numbers until the close of the season, at which time they were abundant.

LOBOTIDÆ

38—*Lobotes surinamensis* (Bloch) TRIPLE-TAIL, FLASHER

One large, very dark example was taken in one of the outermost pound nets on July 13, 1921.

HÆMULIDÆ

39—*Orthopristes chrysopterus* (Linnæus) PIGFISH

A single individual was taken during 1920.

SPARIDÆ

- 40—*Stenotomus chrysops* (Linnæus) PORGY, SCUP

A few adults were taken during 1920. Common from June 1 to 23, 1921, males with running milt; spent fish later, July 14 to October 21, decreasing in numbers as the season drew to a close. From October 10 to 21 many small ones of about 3 cm. ($1\frac{1}{4}$ inches) in length were taken in seines and fykes.

- 41—*Lagodon rhomboides* (Linnæus) SAILOR'S CHOICE

One example was taken during 1920.

KYPHOSIDÆ

- 42—*Kyphosus sectatrix* (Linnæus) BREAM

One example was taken in 1920. Fowler's list fails to mention this fish as being known from New Jersey waters at all.

SCIÆNIDÆ

- 43—*Cynoscion regalis* (Bloch and Schneider) WEAKFISH, BLACKTAIL

Present at all times during both years, increasing in numbers as the menhaden decreased. Sometimes taken in fykes as well as pounds. Many silvery below, while others were more or less golden. The fishermen believe the latter to be visitors from outside waters, while the former are supposed to be residents of the Bay. There was no opportunity to gather accurate data as to the actual cause of the two phases appearing simultaneously, however. Several were examined on June 29, 1921, and a number found to be ripe. Their stomachs contained squid, prawns and the remains of small fish. One example contained what appeared to be a small *Bairdiella chrysura* which in turn held a specimen of *Stolephorus* sp. A few examined on September 14 had fed on menhaden. These weakfish varied in length from 32.5 to 50.5 cm. (13 to 20 inches) and contained fish about 11.5 cm. ($4\frac{1}{2}$ inches) long. In most cases three such young menhaden were found in a stomach.

44—*Bairdiella chrysura* (Lacépède) WHITE PERCH

One medium sized example was taken on June 28 and another on September 14, 1921. No distinction is made by the fishermen between this and *Morone americana*.

45—*Sciaenops ocellatus* (Linnæus) CHANNEL BASS, RED DRUM

One example 82.5 cm. (2 feet 8½ inches) in length was taken on September 13, 1921.

46—*Leiostomus xanthurus* Lacépède SPOT, LAFAYETTE

Common all season in 1920. Present sparingly all summer in 1921, most plentiful in September, falling off in numbers on either side of that month. Much less common than in the preceding year.

47—*Micropogon undulatus* (Linnæus) CROAKER

Common during 1920, being taken at times by the boat load between June 13 and October 22. One or a few examples were taken on each of the following dates in 1921: June 28, July 7, 28, August 25, September 14, 28, and October 20. Some were of a fair size while some were not over 15 cm. (about 6 inches) in length.

48—*Menticirrhus saxatilis* (Bloch and Schneider) KINGFISH

Only small examples were taken both years, averaging about 15 cm. (6 inches) in length in fykes and seines. Fairly common from July 28 to October 21, 1921.

49—*Pogonias cromis* (Linnæus) DRUMFISH, BLACK DRUM

Two examples were taken in September, 1920. One was about 914 cm. (3 feet) and the other about 1219 cm. (4 feet) in length.

POMATOMIDÆ

50—*Pomatomus saltatrix* (Linnæus) BLUEFISH (Young—SNAPPER)

Fairly common in 1920. Taken in 1921 from June 21 to October 21. The adults became more common as the season wore

on, with a drop in numbers, however, near the end. The young were common, being taken in seines and fykes as well as the pounds. By October 11 most of the fish hatched early in the spring had reached a length averaging 15 cm. (about 6 inches), which was well established by a comparison of the serial collections, showing this species to have an extremely rapid rate of growth.

RACHYCENTRIDÆ

51—*Rachycentron canadum* (Linnæus) CRAB-EATER

One large example was taken in 1920.

STROMATEIDÆ

52—*Peprilus paru* (Linnæus) HARVEST FISH, BUTTERFISH

Taken in mid-summer in 1920. Adults were fairly common from June 28 to September 17, 1921. Fowler fails to mention this species at all in his list. Apparently an oversight, as it is mentioned in a paper³ of his of 1906, in which he writes "It is known only from the record of Dr. Abbott. It is properly a native of southern waters and can only be said to be a straggler on our shores." Nichols, writing of the fishes within fifty miles of New York City⁴ says "The Harvestfish is occasionally common in summer - - - ." The experience of the writer has certainly confirmed the latter statement and it seems remarkable that as late as 1906 only one record of this species had found its way into regional literature.

53—*Poronotus triacanthus* (Peck) BUTTERFISH

Very common during both seasons. Abundant in fall of 1920. Most numerous during the early part of the season of 1921, their numbers falling off prominently after September 28. Adults and juveniles were seen in approximately equal numbers from June 7, which is an early date for the species, to October 21, 1921.

³ 1906—The Fishes of New Jersey, by Henry W. Fowler. Report of the New Jersey State Museum, 1905.

⁴ Fishes of the Vicinity of New York City, by John Treadwell Nichols. American Museum of Natural History, Handbook Series No. 7, 1918.

CARANGIDÆ

54—*Seriola zonata* (Mitchill) PILOT, PILOTFISH

A few of fair size were taken in 1920, from July 21 to November 8. Only medium sized examples were taken in 1921, mostly less than a foot in length. Seen from July 27 to October 21. Most common in the latter part of August and early September.

55—*Selar crumenophthalmus* (Bloch) [GOGGLE-EYED SCAD]

Two were taken in fall of 1920. A few examples 25.5 cm. (about 10 inches) long were taken on September 14, 1921. Not recorded north of Beesley's Point, Cape May County by Fowler.

56—*Caranx hippos* (Linnæus) JACKFISH, RUNNER

A few were taken in 1920, and several medium sized examples between September 13 and 29, 1921. Recorded from Atlantic and Cape May Counties only by Fowler.

57—*Caranx chrysos* (Mitchill)
YELLOW MACKEREL, RUNNER, GOLDFISH

A few were taken in 1920. Common in 1921, all small and most abundant in September. Taken from August 18 to October 21, 1921.

58—*Alectis ciliaris* (Bloch) THREADFIN, RIBBON FISH

One example was seen on July 29, 1921, and another on August 12, both 10 cm. (about 4 inches) long. Recorded from Cape May County only, by Fowler.

59—*Vomer setipinnis* (Mitchill) MOONFISH, LOOKDOWN

A few small ones were taken in 1920. Two fair sized examples were taken on July 14, 1921, and another one of about 4 cm. (1½ inches) on October 17. Fowler records this from Cape May County alone.

60—*Selene vomer* (Linnæus) MOONFISH

Recorded in 1920.

61—*Trachinotus carolinus* (Linnæus) POMPANO

Several large examples were taken in fall of 1920 as well as a few small schools of young fish. Many small examples 7.5 to 10 cm. (about 3 to 4 inches) were taken in seines and fykes from September 27 to October 18, 1921. Scattering small individuals were taken from September 27 to October 21, 1921. Much more common than the preceding year.

SCOMBRIDÆ

62—*Scomber scombrus* Linnæus MACKEREL

A few were taken in 1920. A few large and many small examples, 15 to 21.5 cm. (6 to 8 inches) were seen June 7 to July 8, 1921, while from September 18 to October 21, only small ones were observed. Taken in all gear. Small ones 65 to 120 mm. (about 2½ to 4¾ inches) taken on July 7 were found to contain schizopods, copepods, amphipods, *stolephorus* sp. and other mangled small fish.

63—*Scomber colias* Gmelin MACKEREL

Recorded in 1920.

64—*Sarda sarda* (Bloch) BONITO, HORSE MACKEREL

A few dozen examples 914 cm. (about 3 feet) long were taken between September 13 and 17, 1921.

65—*Scomberomorus maculatus* (Mitchill) SPANISH MACKEREL

One medium sized example was seen on August 25, 1921.

LABRIDÆ

66—*Tautogolabrus adspersus* (Walbaum) CUNNER, BERGALL

A few were recorded in 1920. Three small examples were seined in "Dredged Pool" on July 21, 1921.

67—*Tautoga onitis* (Linnæus) BLACKFISH

Fairly common in the fall of 1920. Large and medium examples were taken in pounds in 1921, and by seines in tide pools rather sparingly all season, but becoming more common with the approach of cold weather.

BALISTIDÆ

68—*Balistes carolinensis* Gmelin TRIGGERFISH

Several small examples were taken in 1920. Two fair sized specimens were taken on October 17, 1921, which is a late date for this species.

MONACANTHIDÆ

69—*Stephanolepis hispidus* (Linnæus)
FILEFISH, GRANNY WHALE

Several were taken in 1920. A few small examples were taken from September 13 to October 12, 1921.

70—*Alutera schæpfi* (Walbaum) GRANNY WHALE, HAMBAG

A few large and several small examples were taken in 1920. One large specimen was taken on July 28, 1921, and many small ones, about 20 cm. (8 inches) long, with juvenile markings from then on to October 21. Recorded by Fowler from Atlantic, Cape May and Ocean Counties only.

TETRAODONTIDÆ

71—*Lagocephalus lævigatus* (Linnæus)
RABBITFISH, SMOOTH PUFFER

One dead specimen was seen in the possession of a fisherman on September 15, 1921.

72—*Spheroides maculatus* (Bloch and Schneider)
SWELLFISH, SWELLTOAD, TOADFISH, PUFFER, PUFF-BALL

Common practically all season in 1920, but less so in fall. Common from June 1 to July 15, 1921, becoming scarcer toward the latter date. Many of these fish were nearly ripe and some of the females emitted ova. Later, July 27 to October 21, young were taken in seine from 2.5 to 13 cm. (about 1 to 5 inches) and longer, while adults were irregularly abundant, but all apparently were spent.

DIODONTIDÆ

73—*Chilomycterus schæpfi* (Walbaum)

SPINY PUFFER, BURRFISH, PINCUSHION

Not rare during the fall of 1920, and a single specimen was taken as early as July 27. One large example was reported on July 8, 1921, which is an early date, and small ones fairly common from September 13 to October 21. These latter averaged 10 cm. (about 4 inches) in length.

MOLIDÆ

74—*Mola mola* (Linnæus)

HEADFISH, SUNFISH

A few were reported by fishermen in 1920. One small specimen was reported on June 22, 1921, and others were mentioned by fishermen about this time.

COTTIDÆ

75—*Myoxocephalus octodecimspinosus* (Mitchill)

DADDY SCULPIN

A few were taken in the spring and fall of 1920.

TRIGLIDÆ

76—*Prionotus carolinus* (Linnæus)

SEA ROBIN

A few were seen occasionally all through both seasons but not as common as the following species; medium and small examples only. In 1920, some as long as 20 cm. (about 8 inches) were seen in the autumn.

77—*Prionotus evolans strigatus* (Cuvier and Valenciennes)

SEA ROBIN

Common both years. Seen from June 21, 1921, to season's end. None above medium size. Small examples, 10 cm. (about 4 inches) in length abundant in latter part of season.

ECHENEIDIDÆ

78—*Echeneis naucrates* Linnæus

SUCKER, SHARK SUCKER, PILOT, FISH SUCKER, SUCKING FISH

One was taken on October 11, 1920, which is a late date. Several medium sized examples were taken from July 7 to 15, and 27

to 29, 1921. It is likely significant that their appearance was made only when *Carcharhinus milberti* was also present during this year.

BATRACHOIDIDÆ

79—*Opsanus tau* (Linnæus)

SALLY GROWLER

Medium and small examples were taken in all inshore nets at practically all times both years, but most common in fall. Taken in all gear in 1921, from September 13 to October 21. None of the fishermen encountered knew this species as Toadfish, the appellation generally given it elsewhere.

MERLUCCIIDÆ

80—*Merluccius bilinearis* (Mitchill)

LING, HAKE, SILVER HAKE, SQUIRREL HAKE

Taken in spring and fall of both years. Seen on June 1, 1921, and from October 17 to 21, being absent during warm weather. In spring the specimens were of good size, while in fall they were small, being about 20.5 cm. (8 inches) long. At no time was this species very common.

GADIDÆ

81—*Microgadus tomcod* (Walbaum)

TOMCOD, TOMMYCOD

Taken in fall of 1920. One example was taken on July 21, 1921, in "Dredged Pool" and a few in fykes from October 17 to 21. All small fish.

82—*Gadus callarias* Linnæus COD, (Small, up to 2 feet—SCROD)

Taken in lobster pots at mouth of the Bay during November and possibly later in 1921. First reported November 1. Fish 45 cm. (about 18 inches) long. A few taken in the outermost pounds.

83—*Phycis regius* (Walbaum)

HAKE, LING

A few were taken in the fall of 1920.

84—*Phycis chuss* (Walbaum)

HAKE, LING

Taken in spring and fall of 1920. Taken in spring of 1921. This, like the less common preceding species, disappears in warm weather. One example examined on June 1 was found to be crammed full of large prawns.

PLEURONECTIDÆ

85—*Paralichthys dentatus* (Linnæus)

FLUKE

Fairly common at all times both seasons. The largest individual recorded measured 60 cm., 24 inches in standard length, 67.5 cm., 27 inches in total length, and was a spent female. It was seined on June 21, 1921. Small examples 5 to 15 cm. (2 to 6 inches) frequently were taken in the seine, while most of the large ones were met with in the pounds, and occasionally in the fykes.

86—*Pseudopleuronectes americanus* (Walbaum)

FLOUNDER

All small examples taken both years, varying from 5 to 20 cm. (about 2 to 8 inches) in length. Taken throughout the season of 1921 and chiefly in seines.

87—*Lophopsetta maculata* (Mitchill)

WINDOWPANE

Plentiful both seasons, none seen over 18 cm. (7 inches). Absent in August and September of 1920, but present at all times in 1921. The stomach contents of several examined on June 1, 1921, consisted of crustacean remains, probably schizopods. On August 25, a small example was seined in which the right side was almost as well pigmented as the reverse. Only the under part of the head and abdominal region was white, the remainder duplicating the normal color of the left side. Fowler does not record this species from Monmouth County.

88—*Etropis microstomus* (Gill) [SMALL-MOUTHED FLOUNDER]

One example, 7.5 cm. (about 3 inches) long was taken in a seine on September 28, 1921. This species is not included in Fowler's list as being known from Monmouth County. Deposited in the American Museum of Natural History.